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AVIATSIYA I KOSMONAVTIKA

No. 2, February 1982

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CONTENTS

AIR FORCES

CONTENTS OF 'AVIATION AND COSMONAUTICS', FEBRUARY 1982

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 p 1

[Text] Contents

On the Cover

Outside front--Flying wingtip to wingtip toward the target. A photographic study by I. Kurashov and M. Kliment'yev.

Inside front--Twenty-three February--Soviet Army and Navy Day. Photographs by I. Kurashov and V. Yudin.

Inside back--Russia's first military pilots. Photographs from the archives of the Central Palace of Aviation and Cosmonautics imeni M. V. Frunze.

Outside back--On the eve of flying. A photographic study by A. Romanov.

11004
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AIR FORCES

FIGHTERS: PROBLEMS IN COMMAND POST DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 4-5

[Article by Lt Gen Avn I. Dmitriyev, USSR distinguished military pilot: "The Command Post Controls the Battle"]

[Text] During the exercise the fighter-bomber group had to raid a temporary "enemy" airfield. The aerial situation, the weather and the tactical proficiency of the pilots permitted the hope that the assignment would be completed successfully. But after the group had overflown the "front line" a message came in from a scout, who had taken off earlier, that the objective of the proposed raid had not been found (it was discovered later that the "enemy" had moved his airfield the night before). The situation became dramatically more complex. It required an immediate decision from the commanders and the command post: return the airplanes to the base or give them a new mission. While they sat there deliberating, time was lost. It was only owing to the personal initiative of the group leader that a target was attacked on the return trip.

This was a rare case, to be sure. Special attention was turned to it at the exercise critique. It was discovered in particular that the personnel of the ground command post had a poor idea of the dynamics of modern combat, that they lost control in response to the simplest scenario input, and that they were unable to display independence and initiative. It was reckoned at first that the reason lay in insufficient theoretical training, but on being tested, each specialist demonstrated outstanding knowledge of his responsibilities.

Then what was the matter? Seeking excuses, some said that the composition of the combat control officers had changed significantly within a short period of time, meaning that most of them had been unable to acquire the habits of controlling aerial combat. But this was not the answer. The men did know what they were doing, after all. The reason lay in something else: Little attention was being devoted to coordination in the work of the command post and the flying crews, or to ensuring their efficient interaction.

Active progress in the development of aviation, installation of sophisticated navigation and combat resources aboard airplanes and significant growth in mission complexity are demanding intensive growth in the potentials of command posts for successful work. These potentials are created through fulfillment of the combat and political training plan, through deep assimilation of functional responsibilities of each officer and through growth in occupational proficiency. It was for this

purpose that the units have developed a system of instructor training and indoctrination and that they possess the appropriate training literature, instructions, directives and recommendations. It is well known, however, that theoretical knowledge, when not reinforced by experience, cannot produce tangible benefit. A confirmation of this can be found in the example cited above. And when the question comes to who is to blame, we would have to point the finger not only at the chiefs of the command post and the unit staff who are personally responsible for the training of command post personnel, but also those commanders who, in the race for high indicators in fulfilling the flight training plan, try to simplify the aerial situation when working on tactical problems. They often fly the same patterns over and over again, and their tactics are never distinguished by novelty either. Such a stereotypic approach to organizing combat training does harm to the aerial skills of the pilots and has a negative influence on the habits gained by command post personnel in controlling combat activities. In such a situation, moreover, combat control officers may even suffer deterioration of the knowledge and experience they had acquired some time ago in school.

The fluidity of aerial combat and the broad range of attack possibilities coupled with an extreme shortage of time require all command post personnel to coordinate their actions efficiently. A time loss would be totally impermissible. Commands should be transmitted to an airplane efficiently, laconically and quickly.

As an example let me cite the way such training is organized in the collective that had been under Officer V. Antonets's command. The training is planned with regard to the individual preparedness of each combat control officer and the command post, and with regard to the concrete missions of the forthcoming flights. As a rule, time for practical lessons is reserved during the time of preliminary preparations. After the subjects and tasks of the training are discussed, they are approved by the unit commander. The training itself entails playing out all of the actions of the flights. It stands to reason that this game model includes all flight support resources.

Regular integrated training has significantly improved the tactical skills of the combat control officers and raised the quality of flight control.

A final inspection persuaded us that the commanders and political officers of the absolute majority of the district's air force units have assumed the correct course in teaching command post officers how to act competently and resourcefully during flight control.

The command post headed by Major V. Garshunov was recently checked out. Senior Lieutenant V. Prusak, the combat control officer, guided his airplanes to a target faultlessly. The approach maneuver was competent but rather complex. During the critique we asked him to explain why he thought his decision was correct.

"We could have simplified the control process," the officer explained, "but then the pilot would have had to attack the target with the sun in his eyes, which would have made the mission significantly more complex."

In this situation the senior lieutenant's actions were justified, and they attested to the desire of the command post officers to strengthen their combat unity with the

pilots and to create the most advantageous attack conditions for them. This is obviously evidence of a creative approach to fulfilling one's functional responsibilities as well. And commanders who make note of the competent actions of both pilots and combat control officers are doing the right thing.

Because time is short, the command post personnel must exert their spiritual and physical strengths to the maximum. The slogan that guided the pilots in the past war, "If you've seen him, you've won!", is not only pertinent today, but it also acquires deeper meaning in the interaction of the "command post-airplane" system. And in fact, who could know the aerial situation better than the combat control officers? The resolution of ground radar stations is significantly greater than aircraft radar. Therefore the command post should play the leading role in target search, approach and guidance. It is a totally different thing when airplanes come in direct contact with the enemy. Then the initiative in combat control is transferred mainly to the group commanders. The ground control posts, meanwhile, can only inform them of the situation in general terms and transmit commands, make corrections in coordination or steer individual airplanes away from enemy attack.

Clear distribution of responsibilities between ground and aircraft control resources is an extremely necessary task. The outcome of a battle and the probability of fulfilling a flying assignment with high quality depend in many ways on how this task is completed.

Detecting a target and guiding airplanes to it, especially in the face of intense use of electronic countermeasures, is not an easy thing to do. Combat control acquires an intensive and purposeful nature under such conditions. Before an attack, the command post is obligated to gather together its forces, as if to make a swift leap forward. Of course, this should not be perceived in the literal sense. The command post does not have any extra airplanes, and this is not its perogative anyway. What I mean is that the knowledge and experience of the combat control officers must be utilized to the maximum in leading the airplanes to the most advantageous point from which to begin the combat maneuver, and the conditions favoring attack and promoting a decrease in the probability of successful attack by enemy airplanes and antiaircraft resources must be created. In other words out of the many variants, the one that is the most effective must be selected. This is where the ability to control combat acquires especially great significance. A correct decision requires concentration of skill and experience, a deep knowledge of the tactical and technical specifications of enemy airplanes and antiaircraft resources and of combat tactics and methods, and analytical thinking.

There is no imaginable way that the power of an attack can be enhanced without consideration of elements of modern combat such as covertness and surprise. They are precisely what ensure effectiveness of the first attack. The command post must be prepared to provide full support in this aspect as well. This is understandable. Successful combat control depends in many ways on the capabilities of the personnel to conceal the commander's plan of combat.

Moral and psychological maturity is one of the most important foundations from which to develop decisiveness, boldness, coolness and other combat qualities in the personnel. We cannot forget that the best fighting qualities are forged in a situation as close to that of real combat as possible, one in which elements of surprise

are introduced and conditions requiring independence, decisiveness and daring are created. Here again, the combination of having command post officers participate in tactical flight exercises and integrated training sessions produces a tangible benefit. On their own, of course, training sessions are devoid of the maximum emotional load seen in a flight training exercise. But their advantage lies in that the leader always has the possibility of stopping the course of events, replaying the combat control situation and correcting mistakes.

Special mention should be made of the work of party and Komsomol organizations. Their role in raising the responsibility of command post personnel for continual growth in occupational proficiency is hard to overstate. We have many positive examples where the daily concern of communists in the flight control group and of combat control officers effectively influences the quality of training flight control and of flying in exercises. Communists of the party organization headed by Major V. Luk'yanenko are taking an increasingly greater part in preparing the command post for work. Much interest is displayed here in the command training provided to combat control officers. It has become the rule for communist command post executives to report on their personal contribution to raising the tactical competency of subordinates not less than once a quarter. Other measures are implemented as well. All of this work is based on decisions of the 26th CPSU Congress and on directives of the party, the government and the USSR minister of defense concerned with strengthening the country's defense capabilities. Fulfilling these decisions, the airmen are adopting higher socialist pledges, they are carefully honing their occupational proficiency, and they are persistently strengthening the combat readiness of the units and subunits, raising it to the highest possible level.

11004
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FIGHTERS: NEW PILOT TRAINING DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 6-7

[Article by Col V. Zhavoronkov, military pilot 1st class: "No Allowances for Youth"]

[Text] Explaining certain mistakes made by pilots in piloting technique or in the use of fighters in combat, some commanders occasionally look to youth or inexperience as excuses. What more could you expect, they would say. The time will come when they will learn to act more precisely. But is youth the only thing to blame?

Once I witnessed an incident which appeared inconsequential on the outside but which concealed many deep problems.

Senior Lieutenant A. Polezhayev received an unsatisfactory score for a flight control assignment: He made many mistakes. Analyzing the situation carefully, experienced specialists came to the conclusion that the pilot had not received enough training. But what was at fault was not the youthfulness of the officer but something entirely different--violation of the methods of training an air warrior, superficial analysis of flight deviations that appear insignificant at first glance.

Laxity in training also had its effect. The problem was that some instructor pilots, wishing to achieve high indicators in their work with students, assumed a false path--instead of meticulously transmitting knowledge and developing habits, they went for simplification. For example when completing a flight beneath a hooded canopy, they pulled the hood back not above the close-in homing radio station as required by the conditions of the exercise, but much sooner. It is no surprise that the student was able to easily correct his landing approach visually and land the airplane in excellent fashion. As a result it turned out that some pilots, even though they had a rather high class rating, made mistakes in instrument piloting, ones which dropped their grade even below "good."

We naturally cannot condone such a situation. In modern combat, after all, no more allowances will be made for youth. Combat imposes strict requirements on each pilot irrespective of his experience and time of service. Considering all of the deviations we discovered, we temporarily grounded some of the pilots from flying in adverse weather, and we planned additional lessons for them. It was only after 10-12 hours of flying time in a trainer that many airmen of this group were able to complete their assignments with a grade of "good." Later on, owing to systematic training, they reached the required level of aerial skill.

The regiment command reached the right conclusion. The commanders and the party organization made an effort to see that assignments would be completed in strict compliance with exercise conditions, and only with a grade of "excellent." The steps taken had a positive effect on the quality of piloting technique, and particularly in regard to the landing approach in adverse weather.

The problems of improving training methods are regularly discussed at conferences attended by the unit's executives. The instructor training council has the job of developing concrete recommendations to instructors on predicting and preventing typical errors made by flight crews. Additional lessons in aerodynamics and navigator training and the study of the guidelines regulating flying were included in the training system, and paired check-out flights became more organized.

We carefully compared the requirements on operation of a modern fighter with the possibilities of the air warriors and we considered their experience and occupational maturity when drawing up the flight training plan for the winter period of the new training year. We did have to change some previous practices. As an example while pilots with mediocre combat training indicators had formerly been placed in strong flights, the decision was made to now gather them together into a single collective. This made it possible for the squadron and regiment command to plan their lessons more effectively and to keep their flight training under more effective control. After all, a special approach must be taken to the training of pilots who are behind in their training. This is also being taken into account now, in preliminary preparations and in flying.

The training of young airmen is assigned in our unit to the most experienced instructors, who see that discipline and the work-rest schedule are complied with strictly. For example Major A. Bondarenko, a flight commander and a military pilot lst class, works with the young airmen patiently and persistently. The officer has managed to organize his work in such a way that his subordinates (they all graduated from flight schools recently) actively joined the competition and achieved high results relatively quickly. The secret to the success of this commander's flight is, in my opinion, that he deeply analyzed the personal and working qualities of each of his pilots, and he competently and purposefully developed their initiative, boldness and creativity. Major Bondarenko teaches his lieutenants to live and study with an eye on the future. And it is no surprise that his collective has a good record.

Our unit demands identical performance from young pilots irrespective of their time of service, demanding that they fulfill the standards for a lst class rating. This is hard goal to reach, but it is a possible one. Young officers A. Tret'yakov, N. Argeyev and others are already confidently fulfilling assignments in adverse weather during the day and in favorable weather during the night, and they are successfully participating in dynamic aerial combat.

Success, experience shows, depends in many ways on the atmosphere reigning within the collective. I am certain that if the climate in the subunit is healthy and creative, progressive ideas and the most effective work procedures come into being. In one case pilots were beginning a new program. It seemed as if everything was going smoothly--both the lessons and the flying. But one problem soon became troublesome: Some airmen were advancing too slowly in the combat training program. Although much could be explained by objective causes, the main problems were concerned mostly with the pilots themselves and with the planning and organization of the training.

How could the training process be accelerated, and how could the payoff from each flight be increased?

During an executive conference I suggested some ideas on how to improve the quality of aerial skills. Many commanders and political workers made interesting suggestions. For example experienced pilots 1st class officers V. Shcherbina, A. Bondarenko, V. Vorob'yev and others argued that work on complex piloting techniques should be coordinated with tactical training. A number of the proposals had to do with group attacks on targets and with the tactics used by groups of various composition to surmount antiaircraft resources. This helped us to arrive at optimum solutions making it possible to reduce training time and raise the quality with which pilots worked themselves into the new airplane. Putting our efforts together, we drew up the schedule for exercises in complex piloting techniques. This was the starting point from which we soon climbed to dynamic aerial combat. We began devoting more attention to the moral and psychological training of the soldiers and to creating a healthy, creative atmosphere in the military collective. When the people came to understand that someone was responding to their proposals, and that their work was highly valued, and when they saw its results, their initiative flowed forth as from an eternal spring.

There are many problems in work with young pilots that must be considered by the commander and staff. Foremost among them is that of finding ways to intensify combat training and to reorganize it in accordance with the growing requirements. We encountered this problem, for example, as soon as we began flight training in group aerial combat. Some pilots lost their leaders when performing vertical piloting maneuvers at high acceleration. Because of false egoism, and fearing reproaches for their poor performance, they tried to find the leader and get back into formation without telling anyone. Some were able to do so, while others had to return to the airfield alone.

Thus we had to get the pilots to report the loss of the leader by radio immediately, indicating their course and altitude. Then the command post was able to help them regain their position. Owing to this, the airmen soon learned to maneuver successfully in the training duels.

Complex missions are usually associated with certain costs. This is understandable, since much effort and time must be expended in the mastery of modern supersonic aircraft. This effort can be minimized only by organizing flight training well. Experience shows that problems which at other times may seem difficult are solved faster and more effectively in an atmosphere of efficiency and mutual understanding.

This year there is much to do to raise combat readiness even more. Irrespective of his training level, each pilot will have to try to perfect his combat skills and learn to hit his target with the first approach, the first missile and the first shell. In the winter training period our unit's personnel are making an effort to achieve new summits of military proficiency in a socialist competition initiated by the Guards bomber air regiment commanded by Guards Lieutenant V. Sadikov, and to respond with worthy acts to the slogan of the initiators, "Reliable protection for the peaceful labor of the Soviet people!"

11004
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FIGHTERS: INTERCEPT TACTICAL TRAINING DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 p 7

[Article by Guards Maj G. Druzhknin: "Using a Distractive Maneuver"]

[Text] The fighters approached the area of combat. The target was just a few minutes away. The group leader, Guards Captain M. Nechayev, attentively surveyed the terrain as it rushed beneath his wings. He saw an unusual bend in a canal, and then a small city. This was the checkpoint. According to the plan agreed upon on the ground, after the turn the airplanes were to drop to minimum altitude, perform an antimissile maneuver and then attack the target successively in pairs.

But the situation changed dramatically: Nechayev noted "enemy" fighters above them on a collision course. They maneuvered into an advantageous position for an attack with the sun at their backs.

What was he to do? Engage them in combat? But if he did that, they would not be able to support the motorized riflemen. The leader knew that they were repelling "enemy" counterattacks and that their need for air assistance was extreme. Were they to attack the ground targets with the hope that the "enemy" fighters would not have enough time to make their attack, the followers might suffer. This was not an easy mission, and there were just seconds to make the decision.

Quickly weighing all of the "pros" and "cons," Guards Captain M. Nechayev ordered the follower pair to engage the air defense fighters in combat while he assumed the required altitude and rushed in for the attack. Guards Captain V. Voytenkov's airplane followed him relentlessly.

The wide panorama of the training battle opened up before the eyes of the pilots The "enemy" fire positions could be seen well in the distance. Turning their warplanes toward them, Nechayev and Voytenkov pressed their triggers. The strike was accurate. Then they climbed energetically and turned, and once again the fighters were ready for an attack. The "enemy" halted his advance and then began rolling back.

When Nechayev's pair finished its work the air defense fighters descended toward the northeast, apparently having used up their fuel. There was no sense in pursuing them: The main mission had been completed. The leader assumed a course toward his airfield.

At this moment the combat control officer reported to the pilot that a new group of "enemy" airplanes had appeared. Guards Captain Yu. Kolevatov's flight was the closest to it. The command post decided to commit it to combat.

Efficiently responding to the commands of the combat control officer, the pilots of Kolevatov's flight covertly reached the back hemisphere of the "adversary's" airplanes and, climbing to altitude, they made an accurate strike.

As they recovered from the attack, the flight commander once again heard the voice of the flight controller:

"'Enemy flight approaching.... Course..., altitude..., range...."

"Were we to turn left and climb," Guard Captain Kolevatov thought, "we would end up in front of this group. And we'd still be out of range of 'enemy' missiles." In the next instant he solved the problem: Considering that another flight of fighters was following a little behind, he could draw the "enemy" group to himself and lead it into the fire of this other foursome.

"Turn!" Kolevatov commanded his follower.

Climbing, the missile carriers assumed their new course.

As the leader predicted, the "enemy" noticed the target on the screen of his onboard sights and rushed in to the attack. But his impetuousness let him down. Understanding Kolevatov's plan, the leader of the second flight capitalized on the surprise factor. The missile carriers assumed an advantageous position and made an accurate strike on the deceived "enemy."

The Guards airmen prepared carefully for the tactical flight exercise. Under the guidance of experienced commanders the pilots developed various contingencies of aerial combat, they determined different ways of interacting with ground subunits and organizing their support, and they prepared their calculations for actions to be taken in response to changes in target instructions transmitted in the air. The flight commanders tried to give their subordinates maximum independence. Using examples from their own experience, Guards Major Yu. Skorikov and Guards Captain Yu. Yefremenko demonstrated how important mutual assistance and the ability to instantaneously understand a comrade's idea are in modern combat. Flight leader Guards Lieutenant Colonel V. Kondrashov thoroughly worked out the order in which the airplane groups were to taxi out and take off, he described the particular features of operations in the region of combat activities, and he recalled the safety measures.

The "Alert" signal did not catch the airmen unawares. Engineers and technicians under the command of Guards Engineer-Major B. Petrov had prepared the warplanes efficiently for the sorties and created the conditions for swift delivery of the data of the flight recorders for analysis. Special excellence was displayed by Guards Senior Lieutenant of Technical Service Yu. Urdenko, the technician of an outstanding airplane, by Guards Engineer-Senior Lieutenant A. Obel'chak, chief of the flight's technical maintenance unit, and by Guards Warrant Officer V. Korotkiy, a top-class aviation mechanic. Guards Major V. Avdeyev, the squadron deputy commander for the air engineer service, set them up as the example to all of the technical personnel.

The successes of the pilots, technicians and mechanics were competently publicized by party and Komsomol activists. A spirit of rivalry and the desire of each airman to do his job as best as possible promoted successful completion of the missions posed by the command. The Guards soldiers once again demonstrated that they keep their promises. They completed their examination of combat maturity with honor.

11004
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AIR FORCES

PARTY WORK: PRIMARY PARTY ORGANIZATIONS' WORK IN USSR AF

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 8-9

[Article by Lt Gen Avn V. Kuzovov, 1st deputy chief, Air Force Political Directorate, delegate to the 26th CPSU Congress: "For High Aggressiveness and Efficiency"]

[Text] Almost a year has passed since the day the 26th Congress of the Communist Party of the Soviet Union was convened. Communists and all airmen of the air force greeted the decisions of the country's highest party forum with great inspiration and with tremendous patriotism, and it was with a sense of high responsibility that they accepted the requirement imposed by the congress on soldiers of the armed forces--to dependably stand guard over the peaceful, creative labor of the Soviet people. By their practical deeds they are confirming their readiness to defend the motherland and the countries of the socialist fraternity. This was demonstrated in exercise "Zapad-81." All of the missions posed to the airmen were completed with high quality and within the allotted time.

Today, having joined the socialist competition for an honorable welcome to the 60th anniversary of the USSR under the slogan "Reliable protection for the peaceful labor of the Soviet people!", the personnel of air force units and subunits are fighting actively to make each flying assignment effective, to surpass the combat standards, to achieve high class ratings, to use equipment and weapons proficiently and to achieve discipline, organization, economy and thrift.

As we know, the party organizations are the political nucleus of the military collective, the center of daily ideological indoctrination and a dependable support to the commanders in training and indoctrinating courageous and competent defenders of the motherland. They do their work concretely, with a consideration for the combat training plans and the missions of the personnel, and they are trying to reinforce each planned assignment with efficient measures.

V. I. Lenin's statement that the stronger our party organizations will be, the broader, more diverse, richer and more fruitful the party's influence upon the laboring masses would be is more important today than ever before. Vladimir Il'ich believed the ideological and organizational unity of the party organizations to be the most important source of the party's strength, invincibility and successes.

The 26th CPSU Congress made a new contribution to developing Lenin's teaching on the party and on the role played by primary party organizations in the development of communism. It emphasized the need for raising initiative, aggressiveness, competency and efficiency in party work in every possible way.

Marching toward the Sixth All-Army Conference of Primary Party Organization Secretaries, the political organs and party committees of the air force units are persistently implementing the decisions of the 26th CPSU Congress. The main task is to raise the effectiveness of every measure. What lies at the basis of the work of the party organizations is not the number of measures, initiatives and resolutions, but the practical payoff they produce, the maximum benefit from them--that is, the work quality. This is the basis of the work of air force political organs and party committees today. They do not forget that the effectiveness of party influence increases when party organizations return periodically to the main issues throughout the year and when each of these issues is concretely reflected in the monthly and long-range plans.

Political organs and party committees in which communists N. Shevchenko, A. Kazak, I. Burtsev, Ye. Chekh, N. Antonov and others work have accumulated positive experience in managing primary party organizations. The main efforts of the political organ officers and party committee members are focused on organizational activities right within the party organizations, on providing them help in solving the problems of combat and political training and on keeping the commanders, political workers and party activists informed about party work. Much attention is now being devoted to improving party life. Making an effort to improve the results of meetings, for example, the officers are working to make each meeting a school of party indoctrination. They are trying to create a situation of free and business-like exchange of opinions, and of high principles and mutual exactingness.

The political organs are constantly accumulating analytical and reference materials on the activities of the party organizations. This is making it possible to approach the planning and analysis of party-political work more concretely and to take steps to improve it. The training provided to party activists is now being organized more purposefully. Concrete and timely topics are brought up for discussion at the meetings and seminars as a rule, problems connected with conducting party meetings and organizing surveillance over the fulfillment of decisions are regularly examined, grounded recommendations are drawn up, and the practice of having communists give reports is being disseminated. The political organs systematically listen to reports and messages from the secretaries of the party committees and party bureaus. The goal of such measures is to teach them the art of party leadership.

Much attention is devoted to improving the forms and methods of controlling fulfillment of decisions. The political organs and party committees have raised the aggressiveness of their fight against violations of party and military discipline, and they are watching more carefully over the implementation of the resolutions of higher organs and of their own decisions. This has noticeably raised the responsibility of the personnel for fulfilling their missions.

It should be noted that commanders and political workers are now being taught how to conduct party work more objectively. Most commanders competently rely on the party organizations, directing their activities toward successful fulfillment of the combat and political training plans, while deputy commanders for political affairs deeply penetrate into the work of party organizations, and together with the secretaries they maintain surveillance over fulfillment of adopted decisions.

Positive experience has been accumulated in the outstanding air regiment which initiated the socialist competition in the air force. Its commander, Guards Lieutenant

Colonel V. Sadikov and his deputy for political affairs, Guards Major V. Sinyakov are making a constant effort to achieve close interaction with the party activists, they are keeping them informed, and by their personal participation in the preparation and implementation of party measures they are making these measures highly effective. The following example is typical in this regard. There was a time when one of the squadrons was satisfied with its flight training indicators. It began growing lax in personnel indoctrination, and it did not react to occasional violations of the flying rules. The regiment commander and his deputy for political affairs held the executives of the subunit strictly accountable for the shortcomings. But they did not limit themselves to this. On recommendation of Guards Lieutenant Colonel V. Sadikov these executives were invited to a meeting of the party committee, which engaged in a serious, principled discussion. Following this, the executives made the correct conclusions and began displaying more exactingness toward themselves and their subordinates. With time, the situation in the subunit changed for the better. Now this is an outstanding squadron.

Greater attention to the activities of primary party organizations and improvements in the forms and methods of their leadership by political organs and party committees enrich the content of their work and impart concreteness and efficiency to it. In turn, the political organs and party committees now have a more active influence on solution of the key problems of combat training, on high-quality fulfillment of combat and political training plans and on raising organization and discipline. In many ways it is precisely owing to such a situation that the overwhelming majority of the air force units have achieved good results in improving the aerial, fire and tactical training of the personnel.

This is especially evident in the regiment in which Guards Lieutenant Colonel V. Gofe is a member of the party committee. During the last training year the Guards airmen initiated a socialist competition in the air force and successfully completed their pledges. The regiment is an outstanding one, and it has been operating without flying accidents for many years. It took first place among air force units in the last review of mass sports work in the armed forces. The personnel completed all tasks of the training year with high quality. Credit for successes belongs primarily to the communists and to all the personnel. But the coordinated work of the command and the party organization of the regiment also have important significance. The party committee constantly keeps in touch with the problems of combat readiness and the quality of aerial skills, and it actively influences their solution. Its work is based on indoctrination of the people, raising their responsibility and developing initiative. Care is taken to see that all progressive ideas are promptly publicized and made available to all, and to help those subunits which fall behind.

The following example is indicative in this respect. For a number of years the squadron commanded by Guards Lieutenant Colonel V. Podchinennov never had any flying accidents. Its score in combat flying was high as well. The party committee attentively studied and generalized the experience of the communist executives and the party organization of the subunit headed by Guards Captain A. Petrov. The regiment organized lessons in which the best pilots and navigators described the best work procedures to their friends and helped them assimilate these procedures. This form of training, when combined with planned measures, was responsible in many ways for the fact that all of the regiment's squadrons enjoyed an improvement in the quality of aerial skills and witnessed a rise in flight safety.

It should be noted, however, that not all political organs and party committees have come to deeply understand the 26th CPSU Congress's demand for significantly improving party leadership and for raising the influence of party organizations on the life and combat activities of the military collective.

Management of ideological work by party organizations requires further improvement. Some of them do not always nurture high political alertness in each communist, and they sometimes fail to teach them to analyze their actions on the basis of the acuity and complexity of the present international situation. While conducting useful and necessary work in general, some political organs barely consider the problems of the ideological indoctrination activities of the party organizations or the moral-political training of the airmen, and they do not study the problems of placing communists in the most decisive areas meticulously enough.

Thus an analysis of the preparations for and conduct of party and party committee meetings in the party organizations of the unit in which Communist Officer S. Belov serves showed that CPSU members did not always take an adequately active part. Problem discussion had deteriorated basically to report giving, and little was said about shortcomings in work, about their causes and about the persons specifically to blame. Naturally the resolutions that were adopted were general in nature as well.

Although the party committee of which Captain S. Zverev is a member did pose important issues, it examined them superficially. Party committee members could not find ways to intensify work within the party, they often condoned bureaucratic practices, they did not live up to their obligations to officials, they did not display high exactingness toward communists reporting on their actions, and they prepared their recommendations with too much haste. In particular they did not always approach solution of the important problems of flight safety in a differentiated manner. A study of the work of the party organizations showed that some of them did not know how to focus the attention of communists on concrete problems with the purpose of ensuring accident-free flight training, and they did not always display party strictness toward those who deviated from the laws of flight service; nor did they deal with shortcomings adequately.

All of this necessitated additional steps to improve the activities of the political organs and the party organizations, and to raise their influence on the tasks at hand. And wherever this work became more persistent and purposeful, high results were achieved in combat and political training.

We have full grounds for saying in general that the party organizations of the air force units have noticeably activated work within the party, and that they have done much to fulfill CPSU Central Committee General Secretary, Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev's directive: "Were every party organization to utilize all reserves within its area and establish due order in everything, it would be an easy thing for the entire country to move forward."

The political organs and party committees feel it their duty to strengthen party organizations and to raise their activity and efficiency in solving the complex and important problems facing the air force.

11004
CSO: 9144/0606

AIR FORCES

FIGHTERS: NEW PILOT TRAINING

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 14-15

[Article by Col V. Lebedev: "Faithfulness to the Wing"]

> [Text] "Sometimes it seems to the young that all of the worst is behind them. The Civil War, socialist reconstruction of the giant country and the heroics of the Great Patriotic War are behind us.... So think young men and women, but their time is now arriving, the baton is now being transferred to their hands from their grandfathers and fathers, and now they will discover what great trials and grand works they are fated to experience."
>
> L. I. Brezhnev
> "Vospominaniya" [Memoirs]

A cold wind roamed the airfield, whipping up fragments of yellowing grass into the air and carrying them into nearby ravines. And in a small brick shack located not far away from the landing strip, pilots gathered together in the changing room. Donning their pressure suits at a leisurely pace, they were preparing themselves for their next take-off. The conversation, though not loud, could be heard. They were talking about international events, about the latest battles on the hockey fields in the country's championship games, and about the latest things in art.

Senior Lieutenant Konstantin Ageyev was the first to emerge. He was a handsome, well-built man, calm and confident in his actions. Approaching a young tree, the pilot halted, pondering for an instant a moist twig on which new buds were already appearing. Spring comes early in this region. Its advent also has an effect upon the moods of the people.

Ageyev recalled the same time last year. He remembered the unprecedented enthusiasm and inspiration with which the squadron personnel worked on the eve of the highest party forum of Soviet communists! And the summits in military training the airmen had to take were monumental: They had to assimilate a new modern fighter on an extremely tight schedule. The collective initiated a competition under the slogan "Successful assimilation of modern aviation equipment--the best gift to the 26th CPSU Congress." Communists marched in its vanguard, by their personal example encouraging their fellow servicemen to complete their complex missions with outstanding results.

In the retraining, Konstantin Pavlovich Ageyev worked hard together with other specialists with high qualifications--communists V. Konovalov, S. Baryshev, Z. Askyarov, A. Kubritskiy, P. Knyaz'kin and others. He knew no rest during this time, he worked at peak effort, and he reached the finish line of the precongress competition among the winners.

Taking new summits in flight training every day, constantly improving one's knowledge and broadening one's outlook--this is the rule of life chosen by Senior Lieutenant Ageyev. He inherited his enviable diligence, firm will, generosity and modesty from his parents. His father Pavel Fedorovich and his mother Yevdokiya Ivanovna devoted their entire lives to the good of the motherland, to the concerns of its grain fields. Many things they saw, and many things they experienced, and therefore they knew well the price of every ear they grew. And they taught their children to labor conscientiously. When Konstantin came home for summer vacations, he often went to a nearby fragrant meadow to meet the dawn together with his parents.

Successfully graduating from the Arzamas Instrument Making Tekhnikum, the young man decided to enter the Kacha Higher Military Aviation Pilot School imeni A. F. Myasnikov. This had long been his dream. The sky attracted him by its bottomless blueness and mysteriousness, and it enticed him by its unrepeatable colors. Whenever he was able to visit Gor'kiy he mandatorily went to the monument erected to the famous Soviet pilot V. P. Chkalov. From here, from atop the steep Volga bank, he would watch the remarkable sunsets and enjoy the stillness of the passing day in solitary communion with nature. Here in late autumn he loved listening to the ships greeting each other, and watch the reflections of the clouds dancing over the surface of the mighty river.

Each day his dreams of the sky grew stronger and stronger. All the more so because Ageyev's older brothers threw their lot in with aviation as well. On becoming an officer, Ivan devoted many years to work in the Central Aerohydrodynamic Institute imeni N. Ye. Zhukovskiy. Another of his brothers, Anatoliy worked here as well. He is an engineer. And Vasiliy teaches at the Military Command Air Defense Academy imeni Marshal of the Soviet Union G. K. Zhukov. His sister Anna, an engineer-economist, works at an instrument making plant.

That morning Senior Lieutenant Ageyev could see the whole airfield in the crystal-clear air. The landing strip, the symmetrical slabs of which marched off toward the horizon, extended across the entire field, exposed to the wind and sun. At first the weather was capricious. Incidentally, during his time of service in his garrison Konstantin managed to get used to all sorts of surprises, and he had learned to oppose foul weather with endurance and flying proficiency. But the low cloud cover and the gusty winds coupled with the rain deflated his mood. Only the promise of the weathermen that the weather would improve gave him consolation.

The commander had planned three sorties for Senior Lieutenant Ageyev. He was to work on piloting techniques in the practice zone, fly a preplanned route, and detect and attack a small target. These exercises were not out of the ordinary, and there did not seem to be anything to worry about. During the preliminary preparations he worked out all of the details of each assignment down to their finest points. He foresaw and simulated contingencies in response to changes in the situation. Nevertheless some sort of internal anxiety troubled him. In the last few days his work with the new craft seemed harder with each sortie; there were many exercises to

improve his aerial, fire and tactical skills. Ageyev realized that it was not any easier for pilots to assimilate new airplanes in the war. Incidentally, during the hard years of the Great Patriotic War many of the graduates of the famous school in Kacha became fearless and competent air warriors whose names are now well known throughout the country. And the present generation of Kacha pilots is honorably maintaining the traditions of the veterans, persistently learning from the combat experience of the frontliners.

Junior officers Aleksandr Belyakov, Vladimir Malukha and Nikolay Karasev came to the regiment together with Ageyev and actively joined into the combat training. Things went well for them.

And now they were military pilots 2d class. News that the squadron was to get new fighters and that they were to retrain for them was received enthusiastically. They spared neither effort nor time in the retraining. Everyone knew what they had to do! Once during a party meeting in which the leading role of communists in assimilation of the aviation equipment was being discussed, Senior Lieutenant Ageyev said:

"Our grandfathers won the power for the Soviets, our fathers defended it in the Great Patriotic War, and today our job is to defend the motherland."

Communist Ageyev is continuing in the footsteps of veteran members of the regiment, he is learning courage and the art of modern aerial combat from them, and he is persistently mastering complex tactics. Evidence of this can be found in a recent aerial battle in which the senior lieutenant participated.

"Take off!" the flight leader commander Konstantin.

He released the brakes. The speed indicator's pointer lurched and moved across the scale. Soon the pair of fighters was in the air. The leader glanced at his follower: "That Ageyev is all right! He's confidently maintaining a tight formation."

The airplane flew a complex route at low altitude. This requires maximum composure from the pilots, and the ability to predict the situation a minute or two ahead. There are not that many obvious reference points in this area, and therefore it is important to calculate the course in terms of bearing, speed and time.

The "frontline" passed beneath the wings. Encounters with "enemy" air defense fighters were now possible. The leader reduced his altitude and sharply altered his course. Senior Lieutenant Ageyev repeated his maneuver accurately. The leader of the pair noticed shimmering spots on the background of the bright blue sky: "enemy" airplanes! But they did not present any danger. It was not that easy to pick out the camouflage-painted fuselages of the fighters from the multicolored background of the underlying surface.

The final phase of attack was coming near. A reference point marked on the flight plotting board blinked by beneath the wings. There were just a few more minutes to the target vicinity.

In response to the leader's command, Senior Lieutenant Ageyev shifted over to the left side. The clouds thinned out over the target area. But this did not make things any easier for the fighter pilots. The target was artfully camouflaged. The shadows cast by the thick cumulus clouds did not make the search any easier either. But the keen eyes of the leader detected the location of the small target.

"Maneuver!"

The flight commander climbed energetically at the turning point and rushed in for the attack. The flight parameters were as planned. He sighted and launched his missiles. And then he recovered from the dive and turned away from the target. Now came the time for Senior Lieutenant Ageyev to demonstrate his aerial and fire skills. He came right over the target and attacked it on the run.

The leader was pleased with his follower's competent actions. During the flight critique the commander also gave a high evaluation to this pair, which managed to complete its flying assignment successfully in complex conditions.

Airmen in the squadron in which Officer Ageyev serves completed the last training year honorably. They assimilated the new fighter within the allotted time. Communist Ageyev--one of the winners of the socialist competition in honor of the 60th anniversary of the USSR's formation and the 64th anniversary of the Soviet Army and Navy, also passed his test. The officer demonstrated high skill in recent night flights as well.

The city slept. And not far away the military airfield remained awake, living the measured pace of its life. From time to time bluish white beams from searchlights flashed through the darkness. Multicolored lights marking the landing strip flashed on and off. Short commands could be heard over the thundering roar of the turbines: "Ready!", "Permission to take off granted!"....

Hearing his call sign, the pilot sped to his supersonic modern aircraft. In the blink of an eye he was in the fighter's cockpit. This was Senior Lieutenant Konstantin Ageyev. There were numerous light signal panels and various instruments and buttons before his eyes. It seemed as if there was no free space in the cockpit. He quickly connected the tubes of his pressure suit with accurate, swift motions, ran his fingertips over the switches on the consoles and reported to the command post: "Request permission to start engines."

A few minutes went by, and then came the command to start engines. Soon the supersonic fighter began its take-off run, cutting through the darkness. The pointer of the stopwatch had barely completed full circle before this winged craft, guided by a firm hand, slipped off the cold concrete trailing a bright-orange flame, and swiftly climbed. Soon the fiery trace melted away in the night sky as well.

The aerial warrior returned to the airfield with yet another victory under his belt.

11004
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SPECIAL UNITS: AIRFIELD DEFENSE EXERCISE DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 16-17

[Article by Capt N. Antonov: "A Troublesome Job"]

[Text] The intensity of the training battle reached its peak. The opposing sides committed their reserves to action. For a moment the blanket of thick grayish brown smoke concealed the line of attacking troops. This gave them a possibility to regroup and, using sand quarries to conceal their movements, to try to penetrate the defenses in this sector. And to the surprise of the defenders, the soldiers appeared as if from beneath the ground. There were less than 100 meters between them and the trenches of the platoon strongpoint.

Captain Ye. Andreyev attentively observed the scene of the battle. The night before, while planning the subunit's tactics of defending the airfield against a probable "enemy" assault, the company commander drew up his plan only in general terms. The opposing sides had been given the possibility of displaying initiative.

"Comrade Captain," the radio operator broke the commander's line of thought, "the scouts!"

"As you were! Communications are out."

The radio operator looked at the officer in confusion for a second or two, and then, clutching the receiver, quietly transmitted the officer's decision.

Yevgeniy Andreyev now had the deepest sympathy for his subordinates. As soon as it became known that an "enemy" assault force had landed, the scouts were ordered to determine its location and report its strength and route of travel. This mission was completed. But the events subsequently unfolded in such a way that their detachment was cut off from the platoon strongpoint.

Once again an attack. Following the actions of the attackers, the captain did not forget about the defenders. He could see the soldiers setting themselves up more comfortably in the trench and preparing for fire. He could also sense the anticipation with which they awaited his orders. For a second the thought of forgetting the inputs he had planned for this exercise and continuing to command the battle crossed his mind. But he immediately chased this thought away.

"Warrant Officer Chibisov, take command of the subunit! I've been put out of action," ordered Andreyev and as if confirming his words, he took a few steps back.

The battle flared up with new force. The automatic rifles chattered in unison, the machinegun rumbled hoarsely, and smoke-puff charges were hurled from the trench. However the attackers continued to persist, and they were close to breaking through to the platoon strongpoint. But at this very instant they heard fire in their rear. It was the scouts....

"Stand down! Fire the flare!" the company commander ordered tersely as he glanced at his watch: The time allocated to the lessons was coming to an end. Now a short march to the firing range for a test firing exercise with hand-held weapons.

After the company formed up Andreyev gave his subordinates a long look. The recent enemies now stood in the same rank, and their faces still showed signs of excitement. After letting them rest for a few minutes, the commander conducted a short critique. Nothing escaped his experienced eyes: the fact that the scouts had not acted efficiently at first, and that after getting their orientation they correctly estimated the situation and made a competent decision on their own; and the fact that some of the defenders were not very active while others were overly aggressive. The commander said that the folds in the terrain could have been used better, and that it made no sense to expose oneself to enemy fire for no good reason. In conclusion the captain expressed his gratefulness to Warrant Officer N. Chibisov and Sergeant V. Baylema for their competent actions in repelling the "enemy" attacks, and he congratulated privates F. Abdulov and O. Dazhin for their decisiveness in the attack.

This was an ordinary day in the combat training of airmen in one of the subunits of a separate unit providing security to the air regiment which initiated the socialist competition in the air force.

Realizing their responsibility for the pilots, and always prepared to fulfill any order of the motherland, the enlisted men, NCOs, warrant officers and officers of the unit adopted higher socialist pledges for the new training year and try to fulfill them from one day to the next. The tactical lesson described above was just part of the intensive combat training program.

Company commander Captain Yevgeniy Andreyev always has many things to do. In fact, this communist's initiative seems to be bottomless. For example his subordinates had barely finished refurnishing the company lounge and renovating the Lenin room on his advice when the commander decided to conduct a sports competition. It became a memorable event to both the participants and the spectators. And now the captain is already urging the Komsomol members on to organize a competition for best rifleman and best machinegunner. Gathering together in the barracks during their leisure time, the amateur artists share their ideas for the script of a future evening performance.

That day Captain Andreyev spoke at a Komsomol meeting. It was convened right at the firing range. There was no rostrum, and there were no chairs and tables. But a flash bulletin had already been posted on a special panel, summoning the soldiers to measure themselves up to those who had distinguished themselves in the tactical lessons. It was beside this panel that the Komsomol members convened. The unusual

nature of the situation determined the course of the meeting: The airmen spoke briefly and efficiently, as if in a combat situation. Andreyev noted that today his subordinates seemed to have matured; their faces had become more serious and determined. This meant that everyone was anxious about the state of affairs in the subunits to an equal degree. It was no accident that the personal contribution of each soldier to raising the company's combat readiness was one of the subjects discussed at the meeting. When it was all over, the commander took the floor and reminded the Komsomol members of the subunit's tasks in the immediate future, and he encouraged the soldiers to complete them with high quality and to fulfill the socialist pledges the personnel had adopted in the year of the 60th anniversary of the USSR under the slogan "Reliable protection for the peaceful labor of the Soviet people!"

Yes, the company commander was now certain that the planned summits would be taken. This confidence was reinforced by the personnel's successes in the current training year. Take as an example the firing practice they had today. In addition to the experienced soldiers, many young ones completed their exercises with outstanding scores. And this was no accident, since Andreyev himself, his deputy for political affairs and the subunit's communists and Komsomol members were fully resolved to increase their successes in combat and political training.

It was just a few years ago that Yevgeniy took command of this company, which was seriously behind in relation to all combat training indicators. Andreyev still remembers his talk with the commander and the secretary of the unit's party bureau. They told the young officer specifically what he needed to do in the near future and how to achieve an atmosphere of exactingness in the collective.

The young commander's development did not proceed easily. Sometimes he did not have enough patience: He wanted to do everything himself, and he tried to be everywhere at the same time. Some people said to him: No matter how hard you try, they'll still get you for one mistake or another. Being a company commander is such a troublesome job. You're responsible for everything. But there were other ideas about it as well. The latter were in the majority. Senior comrades, members of the party bureau and staff officers helped him to correctly solve the problems that arose, and they gave him advice on how to organize his work with platoon and section commanders and how to distribute the energies of the active party and Komsomol members.

Captain V. Sukhorukov, the unit's party bureau secretary, turned attention to the fact that sometimes the young company commander was too categorical in his decisions, and that he did not always study his men very deeply. Of course, firmness and decisiveness are good qualities, but might they not generate too much self-confidence? It was then that an incident occurred which confirmed the apprehensions of the party leader. Once Andreyev asked the commander, Lieutenant Colonel Yu. Skabkin, to make Private V. Fil'kov the commander of a detachment. Skabkin had doubts about the appointment, but the company commander insisted. Wishing to uphold his authority, the lieutenant colonel satisfied his request. But a little time passed, and Yevgeniy came to realize that he had made a mistake with Fil'kov. A serious, principled discussion was then held during a meeting of the party bureau. The communists frankly indicated the shortcomings to the officer and suggested ways that he could combat them.

The weeks flew by, turning into months. Andreyev became more exacting, and he started evaluating his activities with higher principles. Gradually a strong nucleus evolved in the subunit, and he was able to rely on it more and more frequently. Andreyev suggested electing Warrant Officer A. Gonchar to the post of secretary of the Komsomol bureau. This was the right thing to do. Soon the company's Komsomol organization decided to support an initiative of the army youth--"Komsomol concern for the training base!" The commander approved this initiative. During their off hours the soldiers got together to reequip the training facilities. The company commander worked with them. Time passed, and soon the classroom had a new electrified model of the airfield, and the guard duties training area's training places were reequipped to permit guards to practice actions in response to an attack on the post, fire and other unusual situations. This had a positive effect on the practical work of the airmen.

Andreyev devoted much time and energy to indoctrinating the commanders of the platoons and detachments. He never forgot his first bitter lesson. Turning attention to the fact that platoon commander Warrant Officer N. Chibisov was unable to establish proper relations with the personnel at first, he worked with him, he monitored his work, he helped him surmount his difficulties, and he offered advice on how he should have acted in one case or another. Chibisov quickly corrected his mistakes and soon began making the correct decisions on his own. Once Andreyev asked him if he had rewarded any of his subordinates recently. The warrant officer replied that he was intending to do so on one of the next holidays.

"But when soldiers distinguish themselves in their work, shouldn't their diligence be noted on the same day, right after the fact?" he asked Chibisov. "If a commander says nice things to a soldier, he will immediately develop the desire to serve even better."

The platoon commander considered this advice. He gradually acquired the knack of a commander-indoctrinator. Things improved in the platoon, and it received an outstanding score for the year's results.

Clear organization of the work of NCOs and reliance upon active party and Komsomol members helped Officer Andreyev to create a unified military collective. The company commander placed practical lessons at the basis of the daily training of the soldiers. During these lessons they regularly practice the methods of securing and defending the airfield. The conditions created in these lessons are always made highly realistic. Decisiveness and military daring are encouraged. The company remembers a case when a "diversionary airfield attack group" outwitted the security guards and penetrated to the garrison, capitalizing on the carelessness of the duty officers at the checkpoint. This group was "liquidated" in the end, but it caused a great deal of trouble. And what was most important, this example graphically demonstrated, was that there can be no simplifications in combat training: That he who displays more initiative and avoids the stereotypes will win.

Organizing the personnel's training and indoctrination, Andreyev demands that the platoon and detachment commanders study their subordinates and their potentials and capabilities more deeply, and work with each individually. During their lessons the commander often plays the role of umpire, and when he does so, the personnel know they can expect the most difficult and unexpected inputs. And after

the lessons he mandatorily subjects them to a meticulous, comprehensive critique. Here again nothing escapes the commander's attention.

The company has now reached the ranks of the outstanding, and the personnel are successfully completing their complex combat training missions. Captain Andreyev has achieved a commander's maturity as well. Recently the officer was rewarded by the commander in chief of the air force for competent training and indoctrination of his subordinates.

The last shots were fired at the practice range. It was time for lunch. In the morning, before taking his subunit out, the commander ordered the master sergeant to deliver lunch to the lesson location. The captain decided to see how well the subunit's "rear services" would be able to complete their task. And the soldiers were satisfied--their life was diverse, the situations they experienced were always different, and their commander was always with them.

Communist Officer Andreyev is an indefatigable, inquisitive, purposeful individual. Perhaps things do not always go smoothly for him, but he has done a lot. And before him lie new works, new concerns.

11004
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FLIGHT TRAINING: LECTURE ON PRACTICAL AERODYNAMICS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 18-19

[Article by Engr-Col (Res) N. Lysenko, doctor of technical sciences, professor: "Secondary Flight Phases and Steady Speed"]

[Text] Captain A. Bruzhas asked the following question of the journal's editorial board: "Is there a connection between stability in relation to flight phase and stability in relation to speed?"

Despite the fact that several articles have been devoted to secondary flight phases in our journal, the editor's office feels it suitable to examine some features of controlling an airplane in these phases once again.

The concept "flight phase" is usually applied to steady straight-line movement of an airplane at constant speed. If speed is to be constant, forces tangential to the trajectory of the airplane must be mutually balanced. If the balance between these forces is stable, the flight phase is referred to as primary, and if it is unstable, it is referred to as secondary.

Recall that the stability of some position of equilibrium can be determined by forcing the airplane out of this state and observing how the forces and moments operating on it change. If the forces and moments change in such a way that the airplane returns to its initial position of equilibrium without the pilot's interference, the position is said to be stable. Take for example an airplane traveling at steady speed. When the latter increases, the lifting force rises (the equation $\Delta Y/\Delta V>0$ is satisfied), and drag X increases more than engine thrust P. The former, which causes skewing of the trajectory upward as the speed increases, is responsible for the airplane's initial tendency to return to its initial speed through conversion of kinetic into potential energy. The latter is responsible for attenuation of the oscillations in speed which arise as the airplane returns to its initial speed.

Thus when we examine stability in relation to speed (as well as in relation to acceleration, yaw stiffness and lateral stability), we presume that the pilot does not interfere in control, and that no limitations are imposed on the airplane's perturbed motion: Traveling freely, it can bend its trajectory upward or downward, gain altitude or descend in response to change in the forces acting upon it.

Flight phase stability is examined in a different way. In this case we presume that as speed changes, the airplane continues to move in a straight line. For this purpose the pilot or automatic devices change the angle of attack in response to change in speed in such a way that straight-line motion would be maintained.

Examination of the stability of such "restricted" (straight-line) motion is of great practical interest, since straight-line movement makes up a significant part of flying. It is especially important to maintain phase stability when flying in formation, when engaging in air-to-air refueling, when descending on a glide path and in other cases.

The stability of a flight phase may be evaluated by examining Zhukovskiy's curves, which show the dependence of drag experienced in horizontal flight and engine thrust on flying speed (Figure 1). As we can see, in this phase of engine operation forces P and X are equally in value at points 1 and 2, and consequently the airplane can maintain steady horizontal flight at velocities V_1 and V_2.

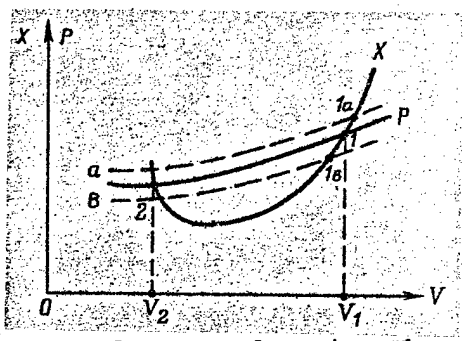

Figure 1. Dependence of Drag and Engine Thrust on Velocity in Horizontal Flight

If for some reason the flight phase is disrupted at point 1, for example due to an increase in speed, then if linear motion is maintained, drag becomes greater than thrust and the airplane begins to decelerate until such time that these forces come into balance again at point 1. Consequently the balance of forces at point 1 is stable, and the airplane continues to fly in primary phase. It would not be difficult to arrive at the conclusion that flight at velocity V_2 corresponds to the secondary phase. In this case when velocity deviates unexpectedly from V_2 and linear motion is maintained with the engine control throttle's position kept constant, the airplane would continue to increase or decrease its speed.

When in the air a pilot inevitably causes a certain discrepancy between flight speed and the phase of engine operation. An airplane flying in primary phase will itself "seek out" the velocity corresponding to the thrust. Thus if the thrust grows larger than required (curve "a", Figure 1), then the airplane would achieve a balance at the velocity corresponding to point 1a; at lower thrust (curve "b") it would achieve a balance at the velocity corresponding to point 1b.

The airplane behaves differently in secondary phase: An insignificant inconsistency between the thrust and drag would be accompanied by a continually growing deviation from the initial velocity, requiring the pilot to maintain the flight phase not only

by turning the stabilizer but also by changing engine thrust, and even descend if reserve power is not enough to prevent deceleration. Thus secondary flight phases require greater attention, especially at low altitude and in the absence of a power reserve. The lower the speed in a secondary flight phase, the faster the same inconsistency between thrust and drag causes a change in velocity (especially when it is falling).

The border between primary and secondary flight phases is represented by the velocity at which the difference between thrust and drag (excess thrust) is maximum (velocity V_3 on Figure 2). For modern turbojet airplanes flying at subsonic speeds, this velocity is close to that at which drag is minimal. Secondary flight phases also exist at supersonic speed. This can be explained by the fact that in these phases, as the velocity of some airplanes flying linearly changes, the thrust of the jet engine changes faster than the drag. However, secondary flight phases do not elicit great difficulties in control or a serious hazard at supersonic speed, though they may cause a forced drop in altitude and worsening of the conditions in which the pilot must perform in combat, for example during interception.

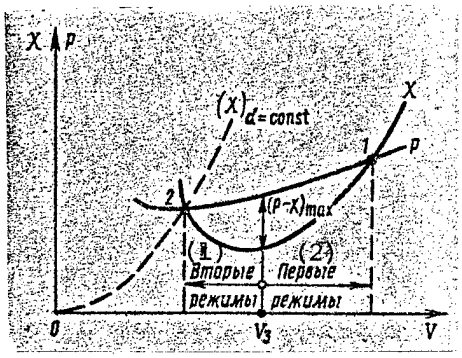

Figure 2. Boundary Between Primary and Secondary Flight Phases

Key:
1. Secondary phases
2. Primary phases

Sometimes the concept "secondary phases" is used in relation to maneuvering flight similarly as with the concept of "secondary phases" in straight-line flight. We know that when high accelerations are experienced in flight, the range of subsonic secondary phases shifts toward larger velocities, drag increases significantly, and the rate of loss of speed rises as well. But the danger of so-called secondary phases when maneuvering with large accelerations should not be exaggerated. Correcting an error causing loss of speed does not present any difficulty: It would be sufficient to simply reduce acceleration until thrust exceeds drag.

The concepts of stability in relation to velocity and the stability of a flight phase have already been discussed. Is there any connection between them? Would an airplane flying in the secondary phase range be unstable in relation to speed,

and is an airplane flying in the primary phase range always stable in relation to speed? An obvious relationship does not exist, since these are two entirely different forms of stability, though they do manifest themselves as change in the same parameter--flying speed. Moreover in the unstable range of flight phases the airplane may be stable in relation to speed, in the same way that it may be unstable in relation to speed in the stable range of flight phases.

Let us assume that an airplane is flying in secondary phase (point 2 on Figure 2). If the balance of longitudinal moments is not disturbed by a change in velocity in the absence of pilot interference, the airplane would keep its angle of attack constant, and drag would vary as shown in Figure 2 by the broken curve--that is, it would change more intensively than thrust. Obviously at velocity V_2, in this case the airplane would be stable in relation to velocity, even though it is flying in the range of secondary phases. We also know that at trans-sonic speeds modern airplanes become unstable in relation to speed because of the development of wave crisis, even though they may be flying in the range of primary phases.

At the same time there is an indirect relationship between the stability of the flight phase and stability in relation to speed, one which manifests itself when an airplane goes from one flight phase to another. Let us examine this relationship using the example in which an airplane goes from one trajectory tilt angle to another. Assume that at the maximum engine operating phase the airplane's polar diagram of climbing velocities is as in Figure 3, which shows the dependence of vertical velocity on sustained flying speed on the trajectory. The area beneath the curve corresponds to flying with acceleration, and the area above the curve corresponds to flying with deceleration. The tangent drawn from the coordinate origin determines the steepest possible climb (point 3). Inasmuch as the steepest climb corresponds to maximum excess thrust $(P-X)_{max}$, then point 3 divides the climb phases into primary and secondary.

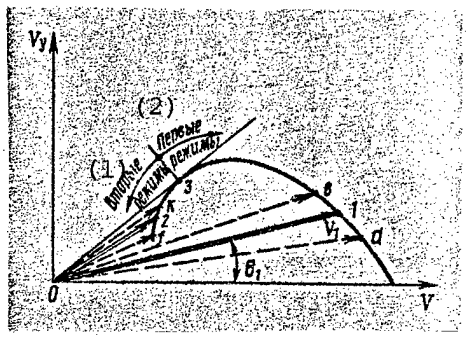

Figure 3. Polar Diagram of Climbing Velocities

Key:
1. Secondary phases
2. Primary phases

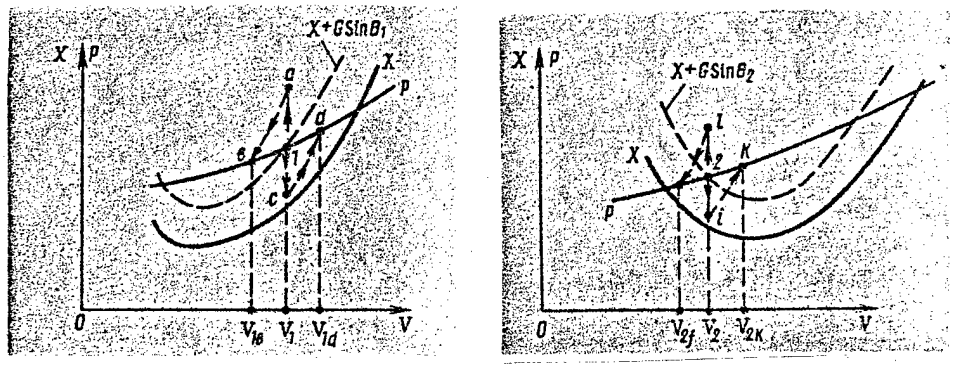

Figure 4, 5. Dependence of Thrust and Drag on Velocity During Transition From One Flight Trajectory to Another

Let us assume that the airplane climbs in primary phase at sustained velocity V_1 and at a trajectory tilt angle of θ_1 (point 1 in figures 3 and 4). Let us determine how the airplane's motion parameters change if the pilot pulls the control stick toward himself and holds it there without changing the engine operating phase. As a result of the stabilizer's movement the angle of attack will increase, and the velocity will not have enough time to change at the first instant. Owing to this the lifting force and the drag will increase, which will cause skewing of the trajectory upward (an increase in θ). An increase in drag and the tilt angle of the trajectory would cause the required thrust $X+G\sin\theta$ (point "a" in Figure 4) to grow larger than available thrust P, and the airplane would lose speed until the equality $P = X + G\sin\theta$ is achieved (point "b" in Figure 4). As a result the airplane achieves balance at a velocity $V_{1b} < V_1$, and at a trajectory tilt angle of $\theta_{1b} > \theta_1$ (figures 3 and 4). It may be demonstrated in similar fashion that when the pilot pushes the control stick away while keeping the engine operating phase constant, the airplane would balance out at point "d" (figures 3 and 4) at greater velocity and lower trajectory tilt angle. Thus in a primary flight phase, change in velocity and in trajectory tilt angle would follow manipulation of the control.

A different pattern is observed in a secondary flight phase. Assume that the airplane is climbing at velocity V_2 and trajectory tilt angle θ_2 (point 2 in figures 3 and 5). If the pilot pulls the control stick toward himself, as was the case in primary phase, the lifting force and drag would rise in the first moment. But because of deceleration resulting from a rise in required thrust over available thrust (point "e" in Figure 5), the airplane would balance out at point "f" not only at lower velocity but also at a lower trajectory tilt angle (figures 3 and 5). If in this flight phase the pilot pulls the control stick toward himself, the airplane would balance out at point "k" at greater velocity and a larger trajectory tilt angle.

Consequently while in primary and secondary flight phases velocity changes owing to movement of the control stick, change in the trajectory tilt angle at which an airplane in secondary flight phase balances out would be opposite to the direction in which the control stick is moved. This is where the complexity and difficulty of controlling the trajectory of an airplane in secondary phase lies, especially when it is flying at full engine thrust. This is why flight in secondary phases is not recommended.

11004
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BOMBERS: UNIT'S INDICES DECLINE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 30-31

[Article by Col V. Aksenov, military pilot-sniper: "Is There More to the Problem Than Carelessness?"]

[Text] The subunits were undergoing their final inspection. The personnel were called in by an "Alert" signal. The airmen occupied their work stations in accordance with the schedule. The actions of specialists of the air engineer service and support subunits were efficient and coordinated. There was no haste or fussing, and high organization, industriousness and strict military order could be felt in everything. Soon the airplanes were prepared, and reports of crew readiness for take-off began reaching the command post. The standards for making the subunits combat ready were satisfied. Crews raised into the air for combat training missions demonstrated good aerial and fire skills, and they struck their targets in adverse weather with the first attack. In terms of all indicators, the air unit that was under the command of Lieutenant V. Kozlov at that time was among the best.

A year has passed since then. What has changed during this time? Another officer took the place of the former commander, and there was some turnover in personnel. As for the rest, everything seemed to have stayed the same. Nevertheless changes had obviously occurred--the personnel achieved mediocre results in the next final inspection. Thus the squadron commanded by Military Pilot 1st Class Lieutenant Colonel Yu. Ruban completed one of its missions below its potentials. Some of the crews earned a zero for their work at an unfamiliar training ground in adverse weather. A quick analysis of the results of the first sorties showed that there was no sense in having the rest of the crews take off, and a decision was made to give the subunits additional time to prepare for the flights. I should state immediately that after the appropriate steps were taken, the personnel fulfilled their mission. Thus it would seem that the mistake had been corrected, so would it make any sense to talk about it any further? I am certain it would, because the price for inadequate training and unpreparedness of the crews is a little too high.

Every airman-officer understands (at least conceptually) the decisive significance of military discipline in successful flying and in raising a subunit's combat readiness. But it is mainly owing to disciplinary violations that the quality of performance in flying assignments is not very high. An analysis of such cases would reveal that all of the points of the guidelines are basically observed and that the personnel and aviation equipment are prepared for flying in accordance

with the rules. Thus it seems to turn out that there is no one to blame for the failures of individual crews. But deeper analysis reveals the true causes, ones which are not superficially noticeable and which are associated basically with the morale factor. Such was the case with Lieutenant Colonel Yu. Ruban's squadron. As it turned out, navigator Major Yu. Buryko, who had been ordered to prepare the program for the sighting and navigation complexes, made a mistake in his calculations. As a result the crews dropped their bombs way off target. The officer was strictly punished.

But the problem has to do with more than just the carelessness of a single navigator. When the new commander arrived in the unit, it was one of the best; everything was proceeding smoothly at first glance, and there were no special remarks to be made. No one penetrated very deeply into the course of combat and political training. And so people gradually became self-satisfied. Seeing that their new commander was not demanding enough, the squadron commanders relaxed their control over the quality with which the personnel prepared for flying, they limited their tests of the personnel's preparedness to a few elementary questions, and they stopped working with subordinates on a personal basis, especially flight commanders. These and other shortcomings in combat training were revealed by officers of the higher staff during the final inspection.

What they noted first of all was thoughtless, and I would say, occasionally stilted planning of flight training. Getting carried away with work on piloting techniques, the squadron commanders weakened their attention to combat applications at night. The pilots experienced interruptions in this form of aerial training, even though they did clock a lot of flying hours. Omissions were also revealed in navigator training. Flight calculations, especially those associated with landing at unfamiliar airfields, were made with outdated information, without regard to the possibilities of the equipment and the requirements of the guidelines. Given a situation such as this in the navigator service, the specialists not only failed to acquire new habits, but they even lost the ones they had. The main cause of navigator Major Buryko's inattentiveness lay, in my opinion, in the well known truth: He who does not move forward will inevitably move backward.

We sometimes hear commanders say that the main form of officer training is independent work. The implication is that each officer must select his literature and draw up his training plan on his own.

There can be no doubt that independent work to improve one's theoretical level is the main form of special training for officers. But this is true only when a clear long-range training plan exists, when the commander has determined the general direction of each officer's professional growth, when senior chiefs systematically monitor the course of this training, promptly making the necessary adjustments in the subordinate's studies. Otherwise the training inevitably loses its purposefulness and effectiveness. And as a consequence from a professional point of view it becomes--the word does not frighten me--useless. And if this is so, then as in

all other things, when we organize the independent work of officers we need strict discipline in planning and in determining the training tasks, and efficient control over fulfillment of these tasks. Moreover the commander is primarily responsible for strengthening this discipline, for making each serviceman aware of the need to observe it in all things, and for teaching him to perceive it as one of the most important prerequisites of successful completion of an assignment. The commander is the one who organizes the combat training of the personnel, relying in his work on the party organization, and directing its activities.

Chapter One of the USSR Armed Forces Internal Service Regulations states that the serviceman must be disciplined, honest, just and brave, and that he must not spare effort or even life itself in the performance of his military duty. The disciplinary regulations state: "Military discipline is based on each serviceman's awareness of his military duty and personal responsibility for the protection of his motherland--the Union of Soviet Socialist Republics."

Neat and short. And the most important thing these lines say is that an officer, and all the more so a commander, has no right to be unconscientious, disorganized and inattentive in the execution of his official duties. He is obligated to note shortcomings in his work and in that of his subordinates. The slightest decrease in exactingness, and mainly toward oneself, inevitably leads to laxity and omissions, and consequently to a decrease in the combat readiness of the crew and subunit. Moreover low exactingness dampens the zeal of the people, dulls their sense of professional alertness and responsibility for their work, and reduces their industriousness. This is why a commander's exactingness toward subordinates and control over fulfillment of orders are inherent elements of firm discipline. We can confidently say that wherever order fulfillment is not meticulously controlled, there is no exactingness either. This means that it would be premature to even suggest that discipline may be high in such collectives.

Shortcomings were revealed not only in Officer Yu. Ruban's subunit but also in its neighbor. The inspection revealed insufficient or, to put it more accurately, superficial control over the quality with which the flight training program was being fulfilled. But the commanders of these squadrons attempted to persuade us that the pilots had simply suffered bad luck, that they were well prepared. To be sure, the pilots did participate in various training assignments throughout the year. Evidence of this can be found in the notations in the appropriate records. How, then, do we explain the fact that because of low preparedness in relation to certain exercises, military pilots 2d class captains S. Bessarabov, V. Tumashev and V. Goga were grounded? And why did Military Pilot 1st Class Captain V. Shvedko never undergo a planned check-out in piloting technique with a simulated engine failure? It should be noted that the regiment commander was aware of this, but he was late in reporting the problem to the senior chief.

How can we describe the control maintained over the training that pilots actually receive? One word is enough--stilted. Analysis of flight recorder data revealed that missions were not being assigned concretely in each sortie, that the pilots were not using their automatic systems confidently and that they were flying basically in manual mode. But it is well known that a pilot cannot be thought of as fully prepared unless he has perfect mastery over all modes of flying in all kinds of conditions, day and night. Moreover the subunits trained irregularly in

combat flying, even though the guidelines impose special requirements on the tactical training of the crews.

It is the duty of each pilot and commander to continually improve his combat proficiency and to make sensible use of each hour, of each minute of training time. This is exactly where we need organization, discipline and industriousness raised to the highest limits. The commander's strictly purposeful efforts to nurture high moral-combat qualities in the personnel are precisely what strengthen his authority and generate a desire in subordinates to fulfill any of his orders as representing the will of the motherland, not out of fear but out of conscientiousness. "No matter what post he occupies, the authority of a worker does not come from without," said Comrade L. I. Brezhnev. "It is gained through personal effort, through daily labor, through real works."

Lieutenant Colonel I. Chervets and Major A. Levitov serve in the same garrison. I have seen their subunits in action many times: efficiency in flight support, high industriousness of the enlisted men and officers, and total absence of haste and fussing in the performance of responsibilities. These commanders always know the real possibilities of the equipment, they schedule its use competently, and they organize its maintenance promptly. The personnel are excellently trained. Combat training and political indoctrination are planned as required by the guidelines, and they proceed in full accordance with them. And it is no surprise that the life and activities of soldiers in these subunits proceed in a smooth rhythm. Engineer-Major A. Zolochevskiy, meanwhile, has not yet been able to achieve such results in his work.

To work conscientiously, competently, with full commitment of energy and knowledge--this is the task that was posed by the 26th CPSU Congress. And it is the duty of every communist to encourage, by his own example, others to implement the party's requirements. This is especially important in the air force. After all, the airplane is a crew-operated weapon. And the success with which the pilot completes his assignment in the air will depend in many ways on how conscientiously every airman does his work on the ground. This is why wise commanders who know the right thing to do take equal notice of the work of pilots and the work of the ground specialists supporting the flying and preparing the equipment, since all labor in which energy, spirit and diligence are invested is worthy of kind words. The latter encourage the individual to work even better and awaken his conscientiousness and a pride for his job. This is very important. As a rule, people who make aviation a career love it and are fully devoted to it. This is why the conscientiousness of airmen is especially high. Moreover it has a most direct relationship with conscious, self-disciplined and disciplined flight work. But sometimes we encounter people in aviation whose conscientiousness lies silent, asleep. This is precisely where we begin to see superficiality, and where unconscientiousness and a bureaucratic, sometimes unprincipled approach to official duties comes into being. And the best medicine in such a moment is a principled, critical assessment of the activities of such people by comrades, communists and commanders.

During exercise "Zapad-81" our pilots demonstrated high occupational proficiency, having competently performed their tasks in conditions maximally close to those of real combat. The military collective headed by Military Pilot 1st Class Lieutenant Colonel V. Mokhov participated in various phases. The air warriors

made strikes on airfields, they provided cover to advancing motorized rifle and tank subunits penetrating the opposing side's defenses, they supported airborne and marine assault landings, and they took part in anti-assault landing operations. In one instance they had to move to back-up airfields in extremely limited time. And high organization and firm military discipline always reigned in the collective. The personnel prepared themselves for the exercise in outstanding fashion: Consider this in light of the fact that this was a complex and laborious process. The sober calculation and firm hand of the commander manifested themselves especially clearly in this regard.

The international situation that has now developed requires that each airman be on guard, that he do everything to improve his occupational proficiency and raise combat readiness. In his speech to the November (1981) Plenum of the CPSU Central Committee, Comrade L. I. Brezhnev emphasized: "Organization, efficiency, discipline--these requirements are immutable both in the center and in the periphery. It is precisely from this point of view that the activities of all party, state and economic organs must be organized." This requirement has a direct bearing on all of our commanders--the organizers of combat training and socialist competition.

11004
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FLIGHT TRAINING: LECTURE ON METEOROLOGY

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 32-33

[Article by Engr-Lt Col D. Finogeyev: "Wind Shift. Its Causes and Consequences"]

[Text] Some of the journal's readers--V. Shpak, N. Abrosimov and G. Kislitsin among them--have asked: What is wind shift, what is the essence of this meteorological phenomenon, and how does it affect flight safety?

The editor's office asked Candidate of Geographical Sciences Engineer-Lieutenant Colonel D. Finogeyev to reply.

Certain successes have been achieved in recent years in meteorological flight support, especially in the take-off and landing phases. Modern landing systems significantly reduce the limitations imposed by the cloud ceiling and visibility. However, while we have been able to weaken the influence of poor visibility and a low ceiling on flying to some extent, the significance of wind as one of the meteorological parameters defining the conditions for take-off and landing remains as before. Moreover while wind-caused limitations were formerly evaluated on the basis of wind speed and direction at ground level relative to the axis of the landing strip, a certain amount of interest is now being shown in data describing the vertical distribution of wind parameters in the layer of air just above the ground.

The parameter characterizing the modulus of the difference between wind vectors at the boundaries of the atmosphere layer in relation to the thickness of this layer is called the wind shift, for which the following intervals have been established in a 30-meter layer: weak--less than 2 meters/sec, moderate--from 2 to 4 meters/sec, intense--from 4 to 6 meters/sec and very intense--over 6 meters/sec. These intervals are determined in relation to the degree of influence exerted by wind shift on airplane take-off and landing.

How does wind shift influence the flight of an airplane? When it takes off or lands, an aircraft crosses through an atmosphere layer in which the velocity and direction of the air current change. Because the airplane possesses a certain degree of inertia and the structure of the air current changes within a relatively small portion of its trajectory, ground speed remains constant. But air speed and, consequently, lifting force change in accordance with the parameters of the air current. The greater the airplane's weight, the more significant is the change in lifting force, given the same wind shift.

Wind shift has a weaker influence on the flight of airplanes having relatively low weight. When such craft fly in the presence of a wind shift, owing to their low inertia a change in the parameters of the air current causes a practically simultaneous change in ground and air speeds. Thus a weakening of the oncoming wind can cause a decrease in air speed, and consequently in lifting force. But as the velocity of the oncoming air current decreases while thrust remains constant, the ground speed rises, and together with it the air speed increases, thus compensating for its initial decline.

Wind shift is especially dangerous in the landing phase when the velocity of the oncoming wind declines as altitude decreases. Under these conditions the lifting force decreases. As a result the airplane deviates downward from the glide path. In order to restore the airplane's position in this portion of the descent, thrust must be increased. But because of relatively long engine response time, this cannot be done quickly. Moreover the higher drag experienced by the airplane when it is in landing configuration creates an obstacle to a fast increase in air speed. If the crew attempts to correct the airplane's position on the glide path simply by increasing the angle of attack, the resulting increase in drag would cause a decrease in air speed and a further loss of altitude.

Here is how squadron commander Major A. Rusets describes landing an Il-76 in the presence of wind shift. A speed of 240 km/hr was maintained during descent on the glide path. After the airplane passed the close-in homing radio station at an altitude of 70-80 meters, speed dropped sharply to 210 km/hr, and the airplane dipped down 20-30 meters. To reduce any further loss of altitude, engine thrust had to be decreased and the airplane had to be placed in horizontal position. Owing to this the crew managed to counter the influence of wind shift and prevent the airplane from touching down before reaching the landing strip.

Taking off in the presence of a wind shift of this type does not present any serious difficulties to the crew, since under these conditions air speed rises as the airplane climbs, promoting a fast gain in altitude.

Growth of wind speed with altitude is typical of the boundary layer of the atmosphere. As a rule this increase occurs rather smoothly. Very intense wind shifts, which have a significant influence on take-off and landing, are rarely observed--in about 3 percent of the cases. Meteorological conditions favoring such shifts are created by significant temperature inversions near the ground, by low tropospheric jetstreams and atmospheric fronts.

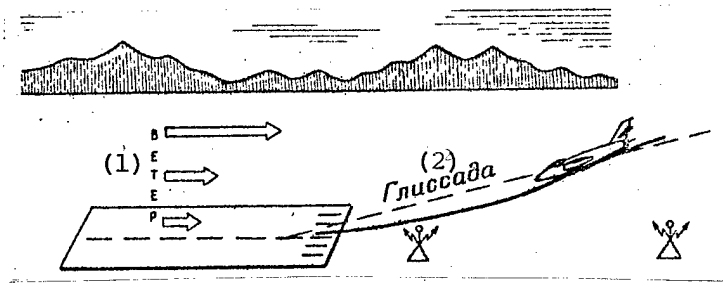
Not only wind speed but also its direction changes in the boundary layer. Usually the wind direction turns to the right as altitude increases. Up to an altitude of 50-100 meters the deviation of wind angle does not exceed 5°. As a rule the wind direction changes abruptly in higher layers, and the angle of this deviation may reach 30-40°. In most cases these changes can be countered relatively simply by a pilot attempting to land his airplane. But if the deviation angle is sizeable and the crew finds itself in these conditions unexpectedly, landing would require a certain degree of proficiency.

Such a case occurred in one of the military transport aviation units. The landing was attempted at night in fair weather. As the airplane approached the long-range

homing radio marker beacon at an altitude of 250-300 meters, the crew felt the airplane turn sharply leftward. The aircraft commander turned right 45°. It was not until after the airplane passed the close-in homing beacon that it settled into its landing course and completed its landing. At the landing strip the wind was from the left at 5-7 meters/sec. The navigator, Major M. Levoshko, noted that it felt as if the airplane had entered into a jetstream and that the course indicating instruments had failed.

Wind shifts of another type, in the presence of which wind velocity decreases as altitude increases, do not cause special difficulties in landing. Under these conditions the lifting force rises as the airplane descends, causing an upward deviation from the glide path. But this does not create any major complications in the crew's work.

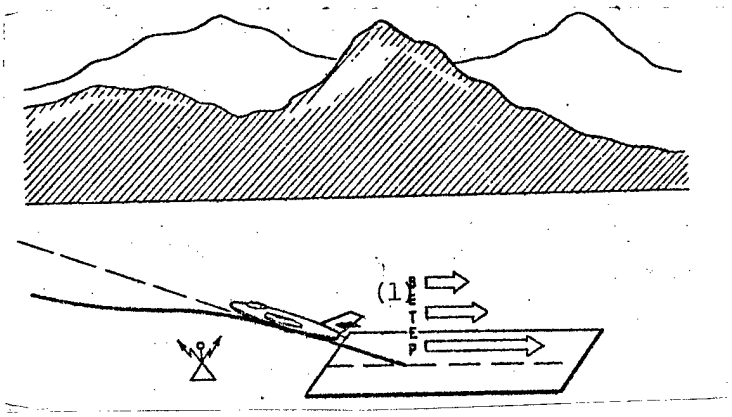
Take-off in the presence of such wind shift presents a certain danger only when the wind shift is sizeable. In these cases air speed and thrust drop as altitude increases. If the airplane does not gain sufficient altitude it may collide with obstacles on the ground. Wind shifts of this sort are rarely observed. Favorable conditions for their formation are created in areas significantly influenced by local winds (breezes, mountain valley winds and so on).



Landing in the presence of wind shift (wind speed rises with altitude).

Key:

1. Wind
2. Glide path



Taking off in the presence of wind shift (wind speed decreases with altitude).

Key:

1. Wind

Wind shifts typified by change in the horizontal and vertical wind components present a special danger to take-off and landing. Such shifts are usually observed beneath cumulonimbus. Vertical air currents traveling in different directions arise beneath such clouds: In the initial stage of cloud development ascending currents dominate, while as the clouds break up the descending currents dominate. The transverse dimensions of these currents vary from several hundred meters to 3-5 kilometers. Speeds of up to 10 meters/sec are observed in descending currents. They are usually accompanied by torrential rains. Near the ground, the air spreads out at a velocity that attains 20 meters/sec and more in a number of cases. Descending currents do not exist very long, and they maintain their maximum velocities for 10-15 minutes. The velocities of ascending currents are usually somewhat greater, and their cross section is smaller.

An analysis of wind conditions beneath cumulonimbus would show that take-off and landing are extremely complex under such conditions, and that accidents can sometimes occur.

One example of the effect this type of wind shift can have on landing is the disaster suffered by a Boeing-747 at Kennedy Airport (USA) on 24 June 1975. Descending beneath thunderclouds, it was caught in a zone of intense rain at an altitude of 180 meters. At 90 meters the oncoming wind, which had a force of 8 meters/sec, transformed into a descending current (6.4 meters/sec), and in 7 seconds the air speed dropped by 32 km/hr. The crew switched the engines into take-off mode, but this did not help, and the airplane collided with the ground 730 meters before the landing strip.

A Boeing-727 crashed during take-off at Stapleton Airport (USA) on 7 August 1975. Not long after its wheels left the ground, it found itself in a zone of intense rain. At an altitude of 30 meters the airspeed dropped from 292 to 210 km/hr within 5 seconds. The crew commander reduced the attitude angle by 10°, but the airplane, which continued to descend, struck the ground.

It should be noted that both incidents occurred just a few minutes after other airplanes had taken off and landed uneventfully, meaning that such wind shifts experience significant temporal variability.

Wind shifts typified by change in the vertical and horizontal wind components may be observed not only beneath cumulonimbus but also some distance away from the boundary of a thundercloud. They occur most probably in the area adjacent to the back portion of the cloud. The range within which such a wind shift exerts an influence depends on the location of the thundercloud and it may extend 30 km from its boundary.

The influence of wind shift on take-off and landing is a significant problem of flight safety. A number of scientific research institutions in our country and abroad are conducting projects involving the measurement and prediction of wind shift and the study of its influence on different types of airplanes. But the results have not yet been widely introduced into the practice of meteorological flight support. For the moment, therefore, we can assess the possible existence of wind shift on the basis of an evaluation of synoptic situations. Using information on take-off and landing conditions transmitted by crews is recommended as a way to determine presence of wind shift, and its magnitude.

To ensure safe landing, it would be a good idea to maintain a flight speed reserve sufficient to compensate for the influence of wind shift without straying from the glide path.

11004
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SUPPORT SERVICES: TECHNICAL SERVICE UNIT'S WORK DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 34-35

[Article by Maj S. Sarnovskiy: "The Engineer's Personal Plan"]

[Text] An officer from higher headquarters visited the Guards air regiment to inspect the work of the air engineer service. He was satisfied with the theoretical knowledge and habits of the specialists. The commanders of the unit and subunit air engineer services acted confidently in response to his inputs. Pulling out their personal work plans, the engineers competently used the statistics and provided well-grounded responses.

The inspector attentively examined Guards Engineer-Senior Lieutenant V. Somenko's personal plan. The officer had made various notations in a certain sequence in his notebook. On the ruled pages he had plotted time in hours on the abscissa and the planned operations on the ordinate. He carefully noted which pledges he had completed, which he had not and why, and how much he had extended the deadline. On specially allotted pages he had recorded the results of inspections made on the supersonic airplanes, and the remarks and conclusions made during technical critiques and during his duty as senior flight engineer.

Officer Somenko isolated three areas in his work upon which he focused priority attention in his planning. The first was organization and control of measures to maintain the combat readiness of the aviation equipment belonging to the air engineer service of which he was in charge. The second area was ensuring the reliability of the supersonic craft, systems and equipment. And finally, the third area was engineering and technical training of the personnel. As a rule Somenko's monthly plans contained about 20 items, and basically they were all specific jobs relevant to his mission.

As we know an engineer must participate in housekeeping days--one of the important stages of equipment preparation--not less than two or three times a month. Guards Engineer-Senior Lieutenant V. Somenko promptly accumulates information on discovered and corrected defects, he generalizes the best operating experience illuminated in information bulletins, and on this basis he plans his work for the next month.

Thus once a pilot wrote down in the airplane preparation log that the program of the automatic system failed during high-speed flight. The parameters it flashed on the screen were not the ones required by the assignment. The defect was not confirmed during the initial inspection of the airplane. Officer Somenko joined in

the search. He spoke once more with the pilot and checked out the records of the onboard apparatus and the flight recorder. It was discovered that the pilot had not zeroed his instrument and, moreover, he had turned on his system a little later than indicated in the instructions. Thus it turned out that he himself had caused the system to err.

Somenko did not limit himself to just explaining the reasons for the failure to the pilot. He added two measures to his personal plan, and then he implemented them. First, during the next down day he conducted a training session for all pilots in the airplane's cockpit, playing out the different variants of the use of the navigation complex. Second, the engineer tested the pilot guilty of the violation on the system's design and operating rules. Moreover he organized technical lessons concerned with unusual cases of flight. This helped the ground specialists and pilots to understand one another better, it raised the effectiveness with which pilots and ground crews sought out faults together, and it ensured the fastest possible return of the airplane to flying. Assume for example that the pilot notices vibration of a pointer. A competent technician can determine the needed direction of search and simulate the aircraft's behavior in flight just on the basis of this tiny detail alone.

Well conceived personal plans are drawn up by Guards Major of Technical Service V. Veshenya and other specialized engineers in the unit. This is typical: The regiment deputy commander for the air engineer service, Guards Lieutenant Colonel V. Kazakov and other chiefs constantly monitor their subordinates and teach them to use each working day and every hour of training time sensibly, with high effectiveness. The ability to plan work and to isolate what is most important from the multitude of current problems is often the topic of discussion at party meetings and work conferences. The unit's executive staff makes sure that every engineer supports new ideas and sets the example for the chiefs of flight groups and technical maintenance units and the technicians in organizing ground training and fulfilling the requirements of planning discipline discussed at the 26th CPSU Congress.

This does not at all mean that every engineer regularly finishes what he has planned and what the regiment deputy commander for the air engineer service approved. After all, a plan is not dogma, but a guide to action. Life sometimes compels us to make corrections in plans; specialists must sometimes change their bearing en route.

Once while attending a critique of the work done by an aviation equipment maintenance group headed by Guards Engineer-Senior Lieutenant T. Shevchenko, the regiment engineer learned that mechanic Guards Junior Sergeant N. Ortskhanov violated the rules of handling the cassette film of the monitoring and recording apparatus. To be sure, Shevchenko did not leave the violation unattended. But in Somenko's opinion he had not followed through as he should have. In particular he had not reminded the personnel of the possible consequences, of the mechanical damage that the parts could have suffered, and he failed to describe a better way to install and remove the film.

After gaining the advice of experienced instructors, Guards Engineer-Senior Lieutenant Somenko substituted one of the items in his work plan by the following notation: "Talk with group chiefs and technicians on maintaining flight recording resources, discuss the methods of conducting critiques." He noted down a tentative date and determined the place--the classroom.

In another instance the engineer organized a demonstration lesson beside an outstanding airplane maintained by Guards Senior Lieutenant of Technical Service Ye. Khafizov. Its objective was to disseminate the best experience of servicing equipment at night. Without a doubt such lessons were of considerable benefit prior to a tactical flight exercise.

Or consider control of the condition of motor transportation. It also requires much effort and time. After all, the slightest malfunction or maladjustment in the equipment of an airfield jet engine starter, fueling truck or air conditioner may also cause problems in the work of an aircraft system. Before, some engineers planned to examine as many vehicles as possible within a shift or a down day. Experience showed that this did not always produce the desired results: When a large number of faults were discovered, a specialized vehicle had to be barred from flight support, and additional time had to be sought for a repeat inspection, and to monitor correction of the fault. This was often detrimental to the plan, since the young engineers could not compete with experienced engineers in their work.

Now a different method is employed. An engineer checks not more than two or three specialized vehicles during a shift. This makes his work easier, it allows him to study the equipment more deeply, without haste, and it also permits him to take steps to see that officials of the technical air maintenance battalion would make the equipment operational in time, and to check their work.

Nor do the engineers forget to include, in their personal plans, lessons with the airmen on what to do in the event of cancellation of flying due to bad weather. They do everything they can to utilize the unavoidable lulls with the greatest benefit. Thus recently the executives of the air engineering service conducted a cycle of discussions and lectures, and they led lessons in technical circles. As an example the personnel have repeatedly studied the features of operating the "Peleng" radiotechnical system, and analyzed the typical mistakes made by airmen. And for the technicians the engineer organized training in postflight preparation of airplanes and equipment with both a regular and a reduced crew. He demonstrated how to organize competition on the standards in this case.

One of the priority tasks of the engineers is personal training, expansion of their technical knowledge. This is also reflected in the personal plans. Of course each specialist works on different assignments, since the complexity of the latter depends on time of service as an engineer. But there are assignments that are worked on in common as well: analyzing unusual cases of flying and excerpting technical descriptions, operating instructions, flowcharts and regulations.

This allows the executive specialists to remain within the mainstream of everything going on with operation of the given type of airplane in their subunits and in other units, and to prevent failures and malfunctions with good results. And during technical conferences the engineers exchange their work experience, which also allows a possibility for improving personal technical knowledge.

Competent planning helps executive officers of the regiment's air engineer service to envisage the events of the next month better, to orient themselves in a complex situation and find the needed solutions, and to achieve new successes in military training and in socialist competition.

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AIR FORCES

FLIGHT SCHOOLS: ANNOUNCEMENT FOR APPLICATIONS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 2, Feb 82 pp 44-45

[Article: "An Invitation From Air Force Institutions of Higher Education"]

[Text] Strengthening the armed forces of the Soviet Union, the Communist Party has devoted and continues to devote special attention to military educational institutions. V. I. Lenin noted that one of the most important causes behind the victories and growing fighting efficiency of our army is that the army contains thousands of officers who had undergone training in new proletarian military schools. These schools were the dependable foundation from which modern academies and schools have grown, absorbing their experience and traditions. Among them, the military aviation schools occupy a worthy place.

The higher and secondary air force military educational institutions accept men who have completed their secondary education--young civilians, enlisted men, NCOs and extended-service petty officers of all branches of troops irrespective of military specialty and time of service in the army, and graduates of Suvorov and Nakhimov military schools, of suitable health for training in school, and having successfully passed the entrance examinations. The ages of applicants are from 17 to 21 years.

Extended-service servicemen are accepted for training after 2 years of extended service but at an age of no more than 23 years.

Seagoing and shore-based warrant officers may enter higher military aviation schools after 2 years of service at seagoing or shore-based warrant officer or officer posts, at an age of not more than 25 years (not more than 23 years for flight schools).

First-term and extended-service servicemen desiring to be admitted for training must submit an application up the chain of command under the unit commander's signature prior to 25 February, while young civilians must submit a declaration to the rayon military commissariat at their place of residence prior to 30 April of the year of admission.

In their applications, military servicemen must give their rank, last name, first name, patronymical, position occupied, year and place of birth, education and the name of the military educational institution they wish to enter. An autobiography, service and party (Komsomol) performance reports, notorized copies of the secondary

education certificate and the birth certificate and three certified photographs (4.5×6 cm, without headwear) must be attached to the application.

The declarations submitted by young civilians must give the last name, name, patronymical, year and month of birth, home address and the name of the military educational institution for which entry is desired. An autobiography, a performance report from the place of employment or study, a party (Komsomol) performance report, copies of the secondary education certificate (students still in secondary school must submit a current transcript) and of the birth certificate, and three certified photographs (4.5×6 cm, without headwear) must be attached to the declaration.

Candidates present their passport, military card or draft card and the original secondary education and birth certificates to the admissions commission.

Candidates travel to the schools of their choice at times established before the entrance examinations, when invited to do so by the schools by way of the military commissariats and unit commanders, who then provide them with documents allowing them free travel. On arriving at their schools, candidates are given free food and dormitory space.

Air force higher flight and engineering schools conduct competitive entrance examinations covering the secondary school program in mathematics (written and oral), physics (oral) and Russian language and literature (written). The Kurgan Higher Military-Political Aviation School conducts examinations in USSR history (oral), Russian language and literature (written), mathematics (oral) and geography (oral).

Secondary aviation schools offer entrance examinations in two subjects: Russian language and literature (written) and mathematics (oral). Young civilian candidates are additionally subjected to physical fitness testing, in the volume required by certain norms of the GTO ["Ready for Labor and Defense of the USSR"] complex.

Entrance examinations are held from 15 July to 5 August.

Persons graduating from secondary school with a gold (silver) medal or from a secondary special educational institution with a diploma with honors need take only one examination--in mathematics (written or oral)--when applying for higher military aviation schools. If they pass the examination in this discipline with an outstanding grade, they are relieved from further examinations, while if they receive a grade of "4" or "3" they must take examinations in the rest of the disciplines covered by the entrance examinations. Secondary school graduates awarded the honors certificate "For Extraordinary Success in Studying Individual Subjects" are relieved from the examinations on these disciplines at secondary military aviation schools.

The following are enrolled by military educational institutions without taking the entrance examinations:

Heroes of the Soviet Union and heroes of socialist labor;

graduates of Suvorov schools applying to higher command (with a 4-year term of study) and higher military-political schools;

persons graduating from secondary school with a gold (silver) medal or from secondary special educational institutions with an honors diploma, and graduates of Suvorov military and Nakhimov naval schools applying to secondary military schools.

In addition persons finishing their first or subsequent years in civilian institutions of higher education successfully (with good and excellent grades) in specialties corresponding to the profile of the given school, and satisfying other requirements for admission to military aviation schools, may be enrolled in the first year of higher and secondary military aviation schools without taking the entrance examinations, following the appropriate interview.

First-term and extended-service military servicemen who have been outstanding soldiers of combat and political training (for not less than 1 year) and who have had their names published in an order of the military unit are accepted into aviation schools noncompetitively, on the condition that they pass the entrance examinations. Extended-servicemen applying to secondary military schools are also accepted noncompetitively.

Candidates sent to schools with all-union Komsomol passes issued by rayon and city Komsomol committees and by unit political sections, and outstanding laborers and kolkhoz farmers are given preference in competition with applicants receiving an identical number of points. Preferential admission to aviation schools from among persons receiving the same number of points in their examinations is also enjoyed by graduates of youth military-patriotic schools sponsored by military schools, by young civilians receiving honors certificates on graduating from secondary schools and by individuals presenting documents attesting to active participation in school and other circles, and in olympiads, competitions and reviews sponsored by higher educational institutions and organizations.

Military servicemen and young civilians undergo competitive selection separately in accordance with the total number of points earned, consisting of the grades achieved in the entrance examinations and the average grade for all disciplines indicated on the secondary education certificate.

The term of study is 4 years in higher flight schools, 5 years in higher engineering schools and 3 years in secondary aviation-technical schools.

During their time of study, cadets are given a 2-week vacation and a month's leave with free travel each year.

School graduates are awarded the rank of lieutenant, engineer-lieutenant or lieutenant of technical service, and they are issued all-union diplomas and awarded the appropriate qualifications.

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CSO: 9144/0606

END